

CHAPTER 4

HOUSING DESIGN AND LAYOUT

4.1 INTRODUCTION

This chapter discusses housing design and requirements for air cleaning units in which filters and/or adsorbers are installed. Two basic designs are addressed in this section: man-entry (**FIGURE 4.1**) and side-access. In addition, two side-access housing types are addressed—one utilizing square filters (**FIGURE 4.2**) the other radial flow/round filters (**FIGURE 4.3**). Both designs are for housings with two or more filters and for system capacities greater than 2,000 cfm. Single-filter in-line housings, man-entry housings larger than 30 high-efficiency particulate air (HEPA) filters, and masonry/concrete housings are not considered here.

4.2 HOUSING SYSTEM DESIGN

Large-volume air supply and exhaust requirements may be met by a number of side-access or man-entry filter housing installations operating in parallel or in a single central system. Parallel housings have the advantages

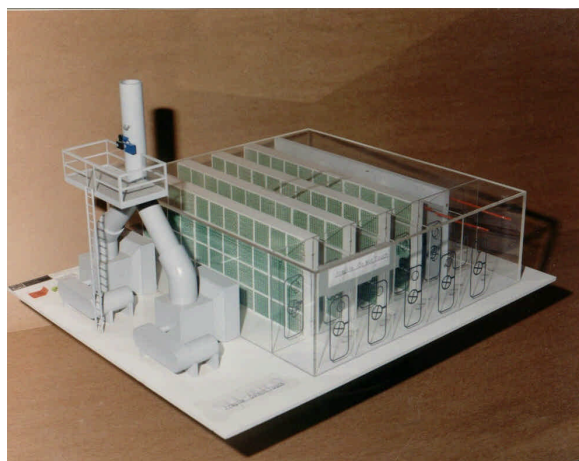


Figure 4.1 – Model of a man entry plenum



Figure 4.2 – Side-access design (square filter)

of (1) greater flexibility for system modification; (2) minimum interference with operations during filter replacement because individual units can be shut down without affecting the remaining systems; (3) good overall ventilation control in the event of malfunction, fire, or accident to one or a few individual units; and (4) easy system testing and balancing.

4.2.1 MAN ENTRY HOUSING SYSTEM DESIGN

A number of open-face filters are installed in parallel on a single mounting frame in a single-housing filter bank design. Filter banks are the more common type of large, multiple-filter installation, but banks larger than 30,000-cfm nominal capacity (i.e., thirty 1,000-cfm filters) are no longer recommended for nuclear exhaust or cleanup service because of difficulties in control, maintenance, and testing. For exhaust and cleanup systems larger than 30,000-cfm capacity, segmentation of the system into two or more parts of equal airflow capacity, with each part in a housing installed in parallel, is recommended. Isolation valves on each housing